

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in Combustion Radiant Heaters

We, JEAN NASSHEUER, ANDREAS NASSHEUER and MARGA HOPFNER, all of German Nationality, trading as JEAN NASSHEUER INDUSTRIEOFENBAU UND ELEKTROTECHNIK, of 75, Lindenstrasse, Troisdorf, Cologne, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to combustion radiant heaters having a perforated flame tube surrounded by a sleeve tube; the end of the flame tube may be closed, completely open or provided with an aperture which is smaller than the bore of the flame tube.

In radiant heating tubes of this kind the gas-air mixture emerging from the apertures of the cylindrical part of the flame tube burns with comparatively fine-pointed flames which are directed immediately on to the cylindrical wall of the sleeve tube and perforate the sleeve tube after a not very long period of service.

According to the invention a perforated screen is arranged between the perforated part of the flame tube and the sleeve tube, the holes of which screen are offset in relation to those of the flame tube. Of course the flames emerging from the apertures of the flame tube likewise impinge on this screen and in fact impinge on it more powerfully, but they are deflected by the screen in such a way that the gas-air mixture emerging from these apertures burns very much more quietly and its flames no longer impinge as fine-pointed flames on the sleeve tube. In this way the undesirable perforation of the sleeve tube is completely avoided.

Particularly in cases where the flame tube is open at its end, the flame emerging from this aperture heats the opposite closed end of the sleeve tube too strongly as a rule, in fact so much so that the sleeve tube is sometimes burnt through. Even when such a

burning-through does not occur, however, the heating of the sleeve tube near its closed end is under certain circumstances more powerful than is desired; in particular it is more powerful than on its cylindrical part, while, under the said conditions of operation for radiant tube furnaces, the closed end of the sleeve tube has to be cooler than its cylindrical part.

Both the burning through of the closed end of the sleeve tube and also the excessive heating of it can be avoided in accordance with a feature of the invention if the perforated cylindrical screen, arranged between the perforated part of the flame tube and the sleeve tube, is closed at its end adjacent to the closed end of the sleeve tube, for instance by a plate, and is provided adjacent this closure with openings in its cylindrical wall, permitting the passage of the combustion gases, which openings are larger than its other apertures. The flame emerging from the end of the flame tube does not then mainly impinge on the closed end of the flame tube, but passes through the said openings into the annular space between the screen and the sleeve tube.

The perforated cylindrical screen may be mounted interchangeably in the sleeve tube, either secured to the sleeve tube or the flame tube, by supports in the vicinity of its open end.

The accompanying drawing shows a radiant heater in accordance with the invention, diagrammatically and in axial section.

A sleeve tube 1 of a radiant heater encloses a coaxial flame tube 2, to which gas and air are fed through a nozzle 3. The gas is supplied through a gas-tube 4 and the air is supplied through a pipe 5 enveloping the gas-tube. In the embodiment shown, the flame tube 2 is provided at its upper end with an aperture 6, which is somewhat smaller than the bore diameter of the flame tube. The cylindrical wall of the flame tube is provided with a large number of apertures 7 which are distributed over its periphery and through

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- which a part of the burning gas-air mixture emerges into the sleeve tube. Between the perforated part of the flame tube 2 and the sleeve tube 1 lies a cylindrical screen 8 which is provided with apertures 9. These apertures 9 are offset with respect to the apertures 7 of the flame tube. At the end adjacent to the closed end 10 of the sleeve tube 1 the screen 8 is closed by a plate 11, and the part of the cylindrical screen adjacent to this plate is provided with perforations 12, through which the burning gas, emerging from the aperture 6 into the annular space 13 between the perforated cylindrical screen 8 and the sleeve tube 1, can flow without the flame impinging on the closed end 10 of the sleeve tube.
- The open lower end of the screen 8 is interchangeably mounted on the flame tube by three equally spaced supports 14. Obviously these supports may also be located on the outside of the screen tube so that it is mounted on the sleeve tube 1.
- WHAT WE CLAIM IS:—**
1. A radiant heater comprising a perforated flame tube, a sleeve tube enclosing the flame tube and a perforated screen mounted between the perforated part of the flame tube and the sleeve tube, the apertures of which screen are offset with respect to those of the flame tube.
 2. A radiant heater as claimed in Claim 1 wherein the end of the perforated cylindrical screen opposite the end of the sleeve tube is closed and the screen is provided with openings in its cylindrical wall adjacent its closed end, which openings are larger than its other apertures.
 3. A radiant heater as claimed in Claim 1 or Claim 2, wherein the perforated cylindrical screen is mounted interchangeably in the sleeve tube, secured to the sleeve tube or the flame tube by means of supports in the vicinity of its open end.
 4. A radiant heater substantially as described herein and as illustrated by the accompanying drawing.
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1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*

